

## NANOSTRUCTURE AND NANOCOMPOSITE BASED COMPOSITIONS AND PHOTOVOLTAIC DEVICES

### ABSTRACT OF THE DISCLOSURE

**[0314]** Nanocomposite photovoltaic devices are provided that generally include semiconductor nanocrystals as at least a portion of a photoactive layer. Photovoltaic devices and other layered devices that comprise core-shell nanostructures and/or two populations of nanostructures, where the nanostructures are not necessarily part of a nanocomposite, are also provided, as are devices including a recombination material and/or multiple electrodes. Varied architectures for such devices are also provided, including flexible and rigid architectures, planar and non-planar architectures, and the like, as are systems incorporating such devices, and methods and systems for fabricating such devices. Compositions comprising two populations of nanostructures of different materials or nanostructures and a small molecule are also described, as are doped polymer nanocomposites. Compositions useful for making nanocomposites are also described.